To users of the Western Wind Dataset:

We have run into some issues on the wind dataset. For many uses of the dataset (general capacity factor comparisons, diurnal or seasonal profile comparisons, etc), these issues may not affect you. However, if you are using the dataset for an extensive wind integration study, then I would suggest you take note that there is sometimes an irregularity in the wind data, that may occur every 3 days (at midnight GMT or 16:00 MT). When 3TIER did the mesoscale model runs, they performed the runs in 3 days blocks and stitched the 3 day blocks together. The blending algorithm over that temporal seam was applied over a short period to ensure that the variability during these times was not unreasonably squashed and that the data set was affected as little as possible. Each location was tested and the largest changes in magnitude did not occur during these times for a majority of sites. Thus, the data was considered sound. Unfortunately, the side-effect of applying the smoothing over a short time period is that when many sites are aggregated up, this change is happening at all sites in a modeling domain at the same time. Thus, while each individual site is modeled with a realistic variation, the aggregation of many sites still has the problem of the temporal seam.

Both Northern Arizona University and GE have examined this and the resulting analyses can be found at:
http://wind.nrel.gov/public/WWIS/spikes/

“Jan_1_2006_Plots_3-13-09 v2.pdf” was prepared by NAU and shows Jan 1, 2006 met tower data from sites in AZ compared to the 3TIER/NREL Western wind dataset and also compared to the 3TIER/NAU wind dataset (this was commissioned by NAU from 3TIER for the APS wind integration study which completed over a year ago). This shows that the spikes in the 3TIER/NREL dataset were not observed in the met tower data or the 3TIER/NAU data. This was one of the largest wind spikes we saw in our WWSIS study.

“Spikes.ppt” was prepared by GE and shows that the large wind ramps are nearly all coincident with this temporal 3-day seam. The wind deltas of 2000 and 3000 MW are over 5 hours.

“3 days profiles.pdf” was prepared by GE and shows the hourly wind deltas in AZ and WY for each month, with the 2*sigma variability plotted as the bar length and the whiskers showing the extremes. GE has found that the variability is highest around the 16:00 MT hour every 3 days.

In addition, if you are using the wind forecast data, please note that there is a positive bias (overestimation of wind) in the forecast data for many sites- the forecasts were created using different inputs and a different methodology to ensure that the forecasts were not unrealistically accurate. State-of-the-art forecasts would use on-site data to correct the wind energy forecast and effectively remove this bias - but such work was beyond the scope of this project. We have noticed that this bias is approximately 10% in the Westconnect footprint (AZ, WY, CO, NV, NM) and 20% in the rest of WECC. If you

use this forecast data in production simulation analysis, you may find that the overestimate of wind results in under commitment of generation which leads to higher spot prices. Of course, not all locations have a positive bias, so you should be careful in trying to apply simple rule of thumb corrections.

We are developing workarounds for using this data in our WWSIS study. We encourage you to contact us if you also need workarounds for your studies. We apologize for the problem, but we also just discovered this ourselves.

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